

# Hood Canal Summer Chum Salmon ESU

Artificial Propagation Review

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Salmon Recovery Division

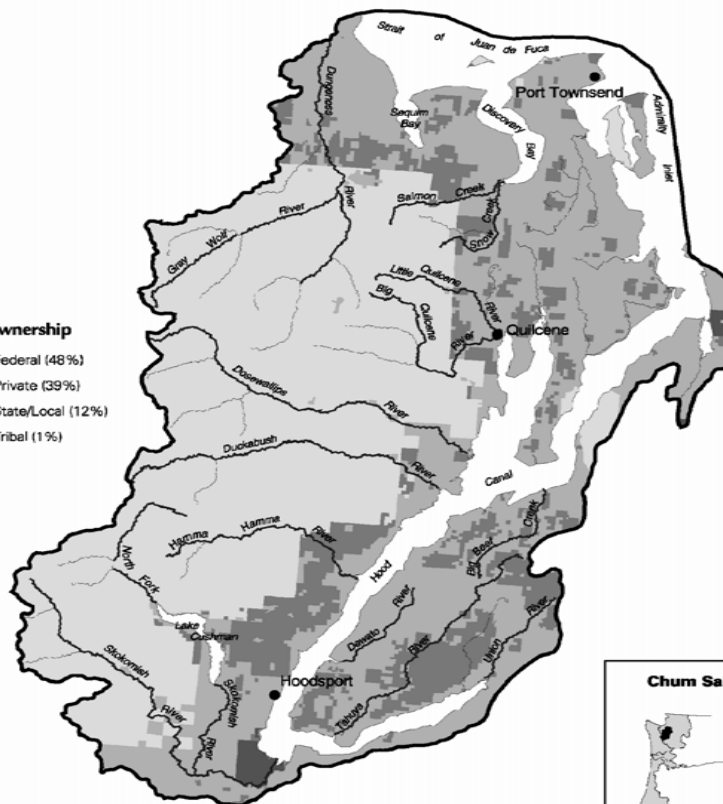
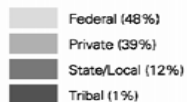
# Hood Canal Summer Chum Salmon ESU

- Includes all summer chum salmon populations in Hood Canal and eastern Strait of Juan de Fuca, Washington.
- 16 historically independent populations, nine of which are extant currently.
- ESU is the focus of the *Summer Chum Salmon Conservation Initiative* (SCSCI) developed and implemented since 1992 by the co-managers to preserve and rebuild the populations.
- SCSCI includes six supplementation and two reintroduction projects, harvest management protective measures, and habitat management recommendations.



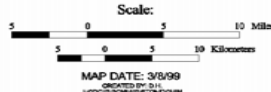
## HOOD CANAL SUMMER-RUN CHUM SALMON ESU

### Land Ownership



Note: Map is for general reference only.

United States Department of Commerce  
National Oceanic & Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
HABITAT CONSERVATION DIVISION  
525 N.E. Oregon St., Suite 410  
Portland, OR 97232  
Tel (503) 231-2223



MAP DATE: 3/5/99  
DESIGNED BY: B.H.  
HOOD/CANAL/ESU/CHUM

### Chum Salmon ESUs



Figure 1. Hood Canal Summer-Run Chum Salmon ESU.



# ESU Historical Factors for Decline

(BRT, 2003)

Impact ratings judged *major* or *moderate*:

- Habitat degradation/loss cumulative impacts,
- Freshwater conditions (adverse natural),
- Past terminal area fisheries over-exploitation,
- Canadian fisheries incidental harvest, and
- Other salmonids - ecological interactions, including hatchery fish.

ESU = "Threatened" (7 of 16 populations  
extirpated, *widespread loss of estuary and lower  
floodplain habitat is ongoing risk factor*)

# Summer Chum Populations in the ESU

- Quilcene natural, including Quilcene NFH and Big Beef Creek FH fish;
- **Dosewallips natural;**
- **Duckabush natural;**
- Hamma Hamma natural, including Hamma Hamma FH fish;
- Lilliwaup natural, including Lilliwaup FH fish;
- Union natural, including Union River FH and Tahuya FH fish;
- Salmon/Snow natural, including Salmon Creek FH and Chimacum FH fish;
- Jimmycomelately natural, including JCL FH fish;
- **Dungeness natural.**

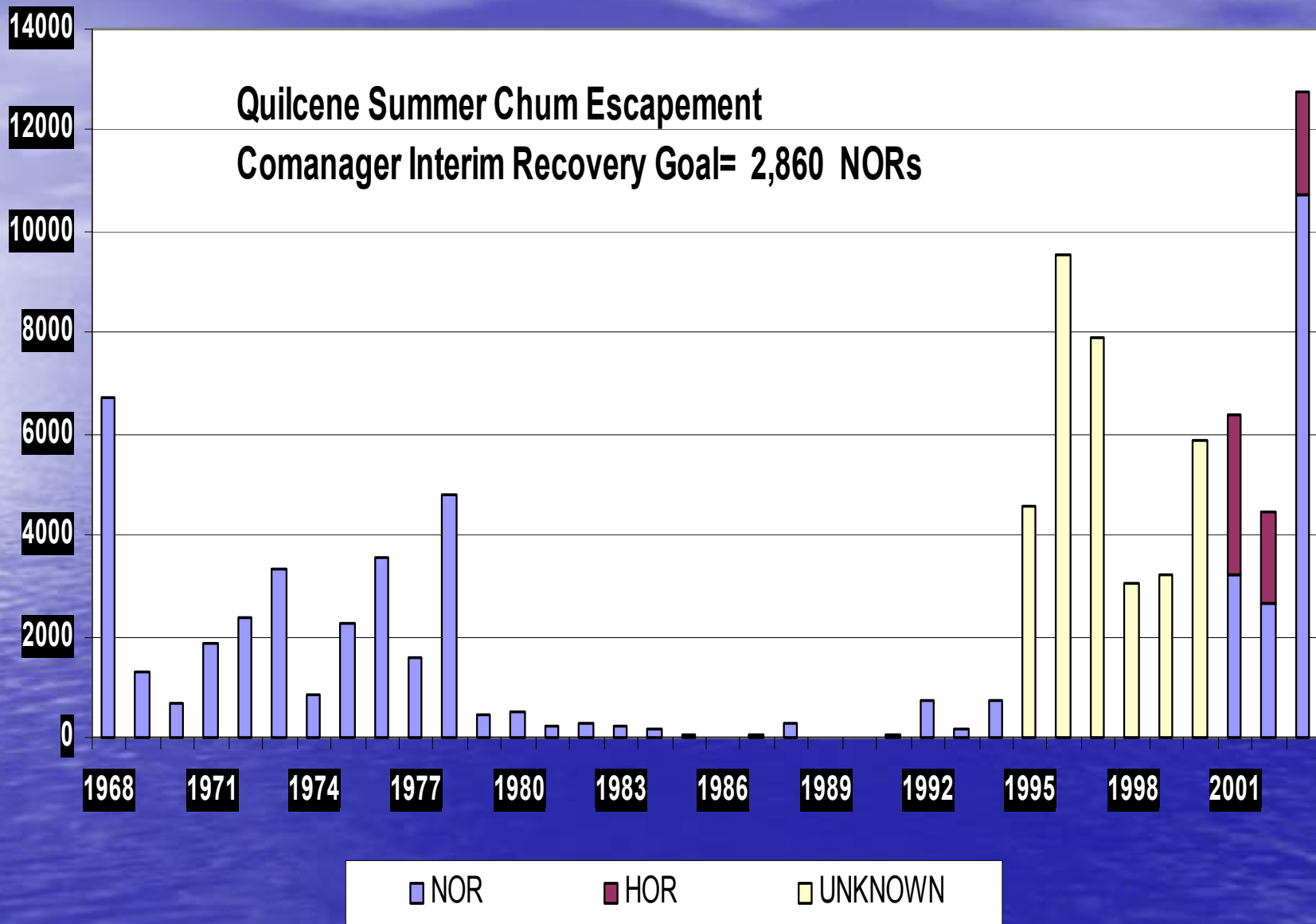
# Extirpated Populations

- Dewatto
- Tahuya (reintroduction from Union)
- Skokomish
- Anderson
- Finch
- Big Beef (reintroduction from Quilcene)
- Chimacum (reintroduction Salmon)

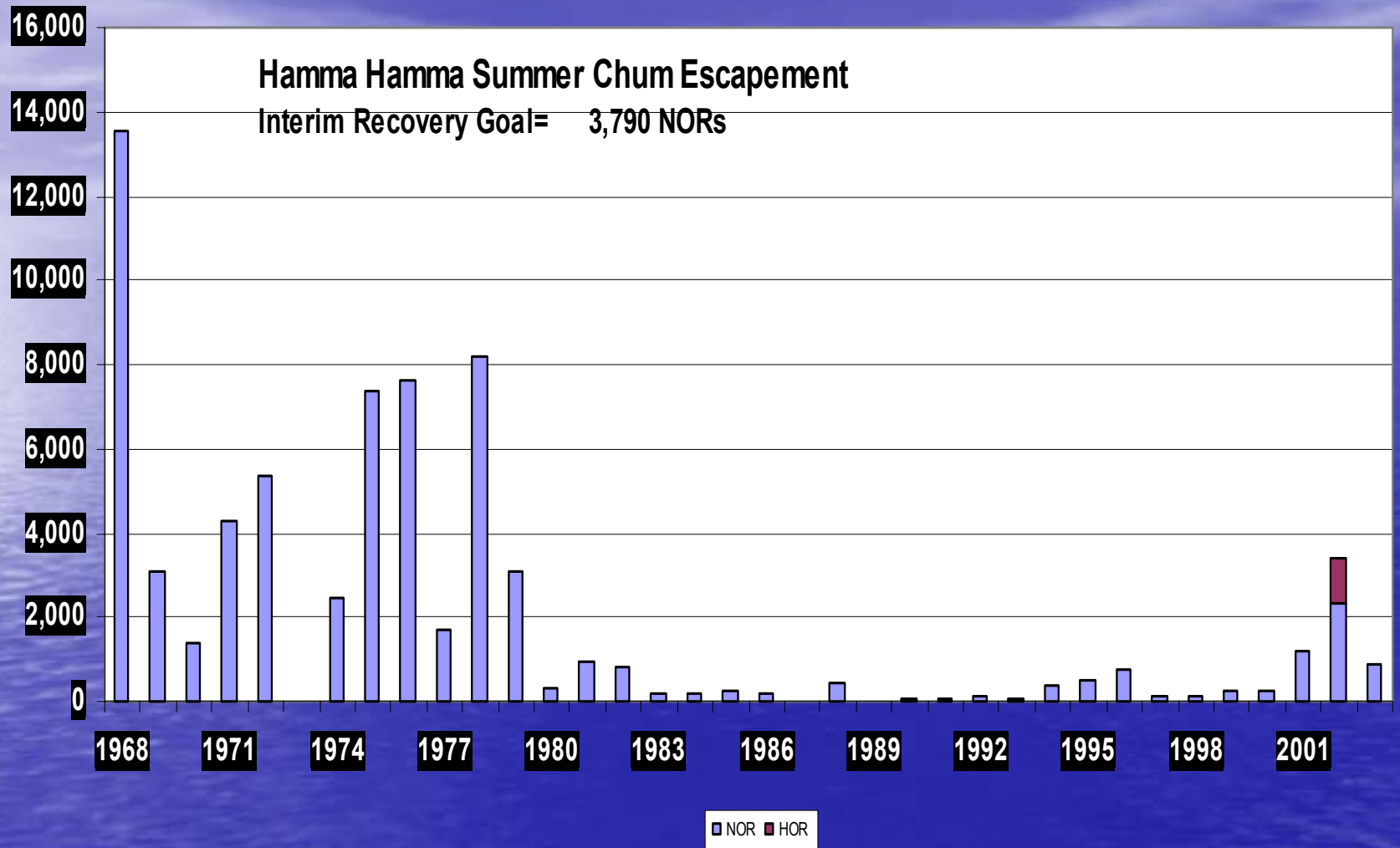


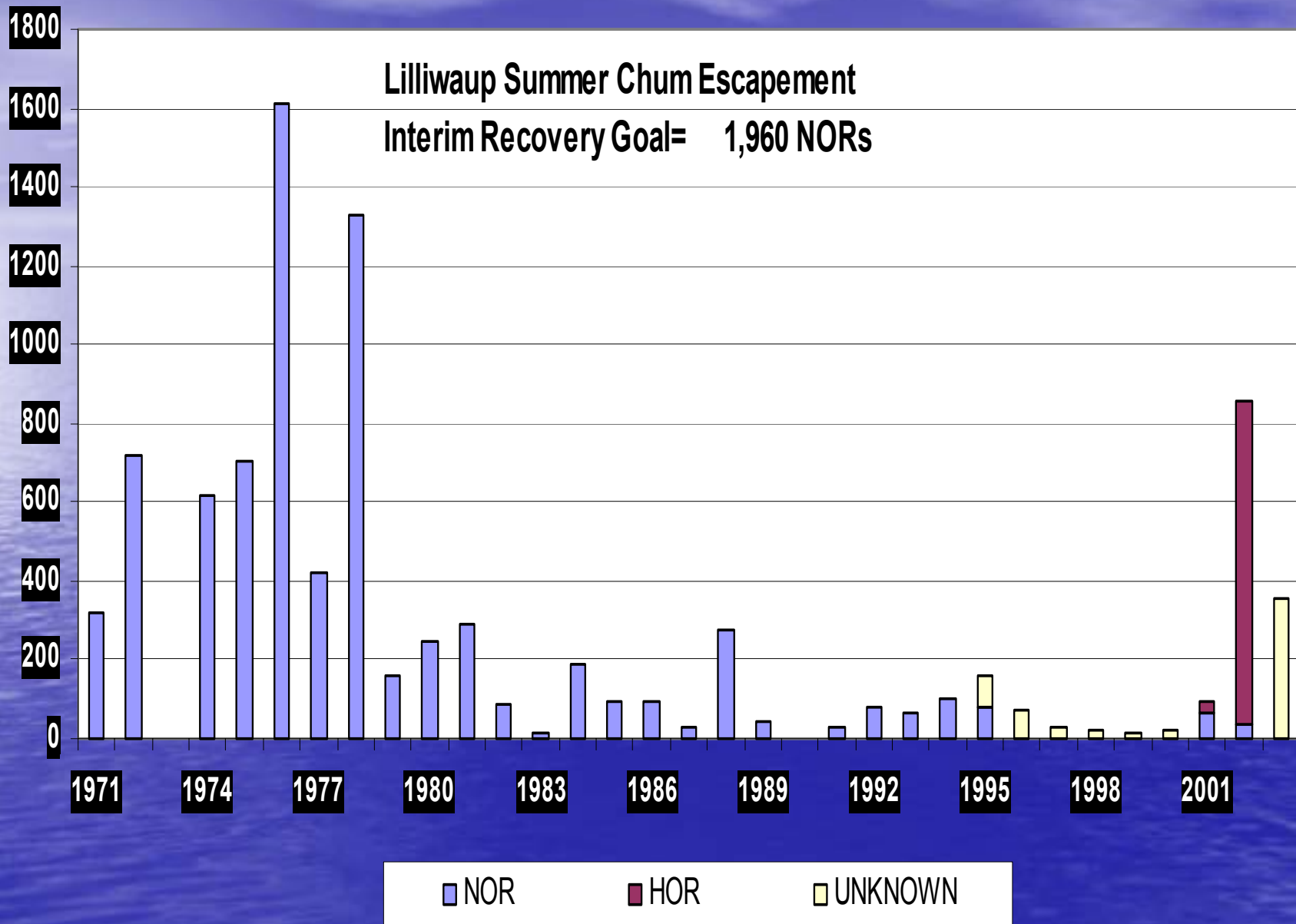
# In ESU Hatchery Program Inventory

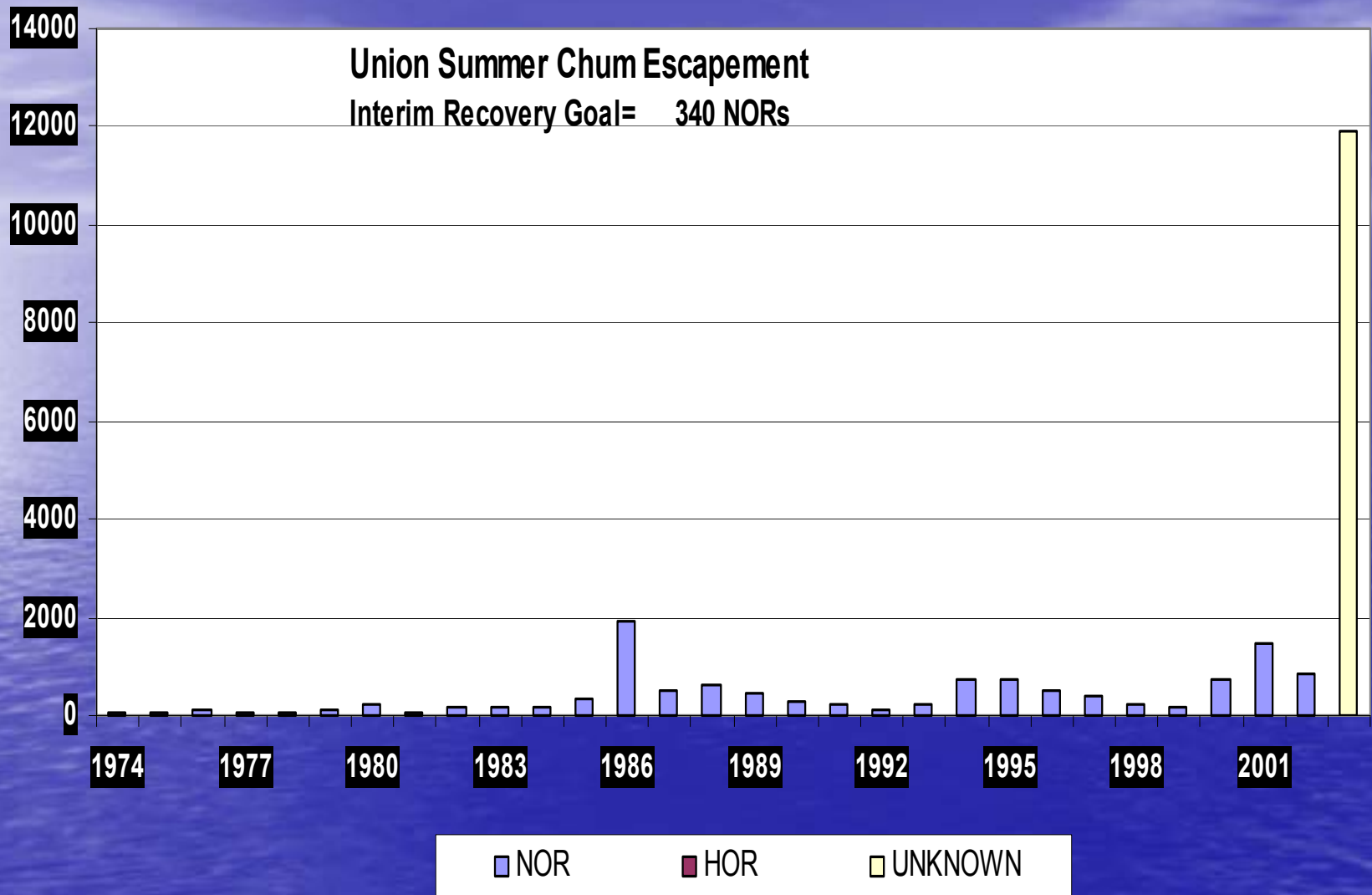
Population/Program	Iso/Integ	Purpose	Release #s/Type	Adults/Year *
<b>Quilcene</b>				
<b>Quilcene NFH</b>	Integrated	Conservation	389,000 fed fry	3,087
<b>Big Beef Ck FH</b>	Integrated	Reintroduction	86,000 fed fry	511
<b>Hamma Hamma</b>				
<b>Hamma<sup>2</sup> R. FH</b>	Integrated	Conservation	802,000 fed fry	1,074
<b>Lilliwaup</b>				
<b>LilliwaupCk FH</b>	Integrated	Conservation	376,000 fed fry	679
<b>Union</b>				
<b>Union R FH</b>	Integrated	Conservation	86,000 fed fry	na
<b>Tahuya R FH</b>	Integrated	Reintroduction	352,000 fed fry	na
<b>Salmon/Snow</b>				
<b>Salmon Ck FH</b>	Integrated	Conservation	86,000 fed fry	911
<b>Chimacum Ck FH</b>	Integrated	Reintroduction	123,000 fed fry	483
<b>Jimmycomelately</b>				
<b>JCL Creek FH</b>	Integrated	Conservation	86,000 fed fry	55

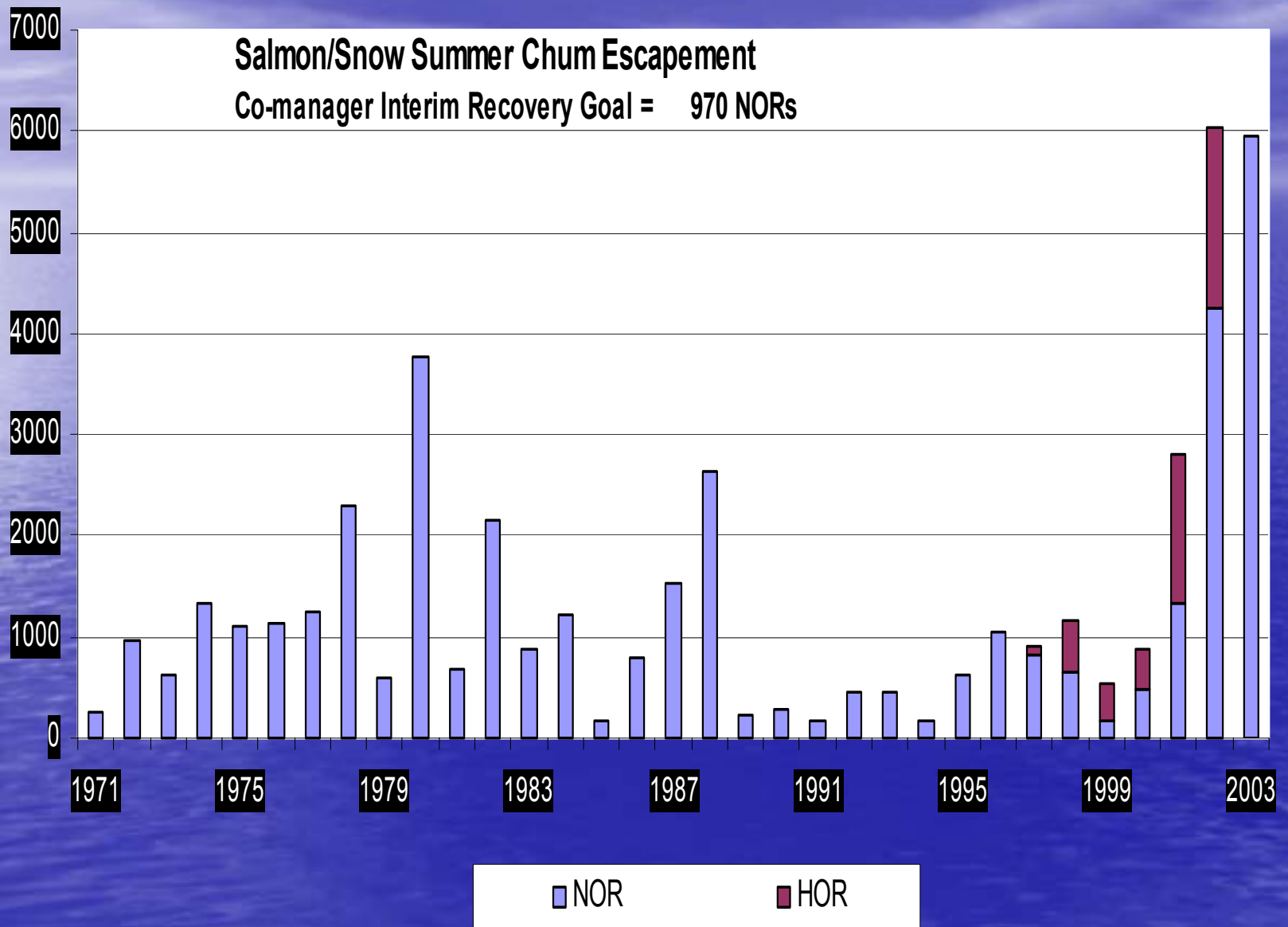




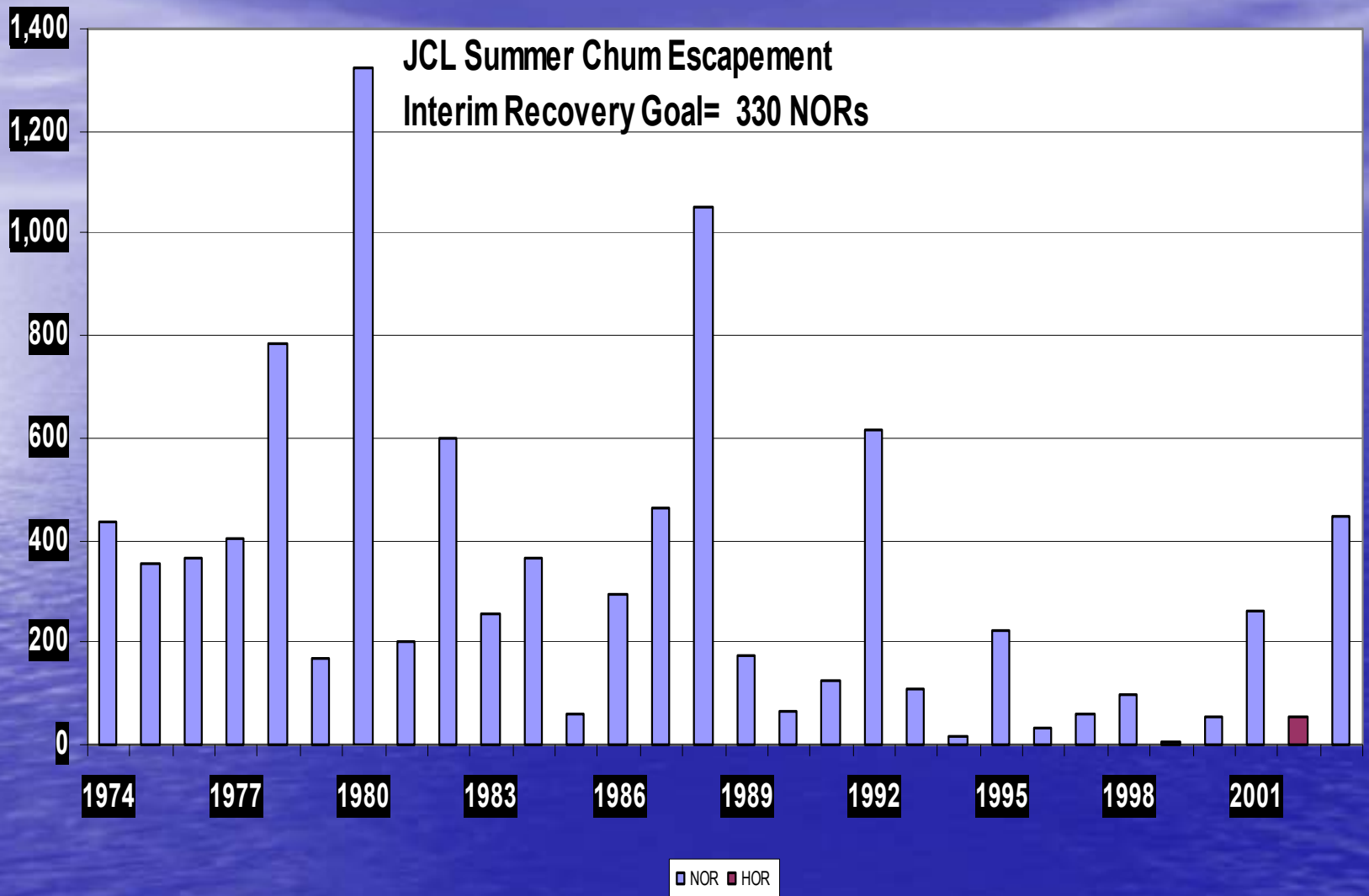


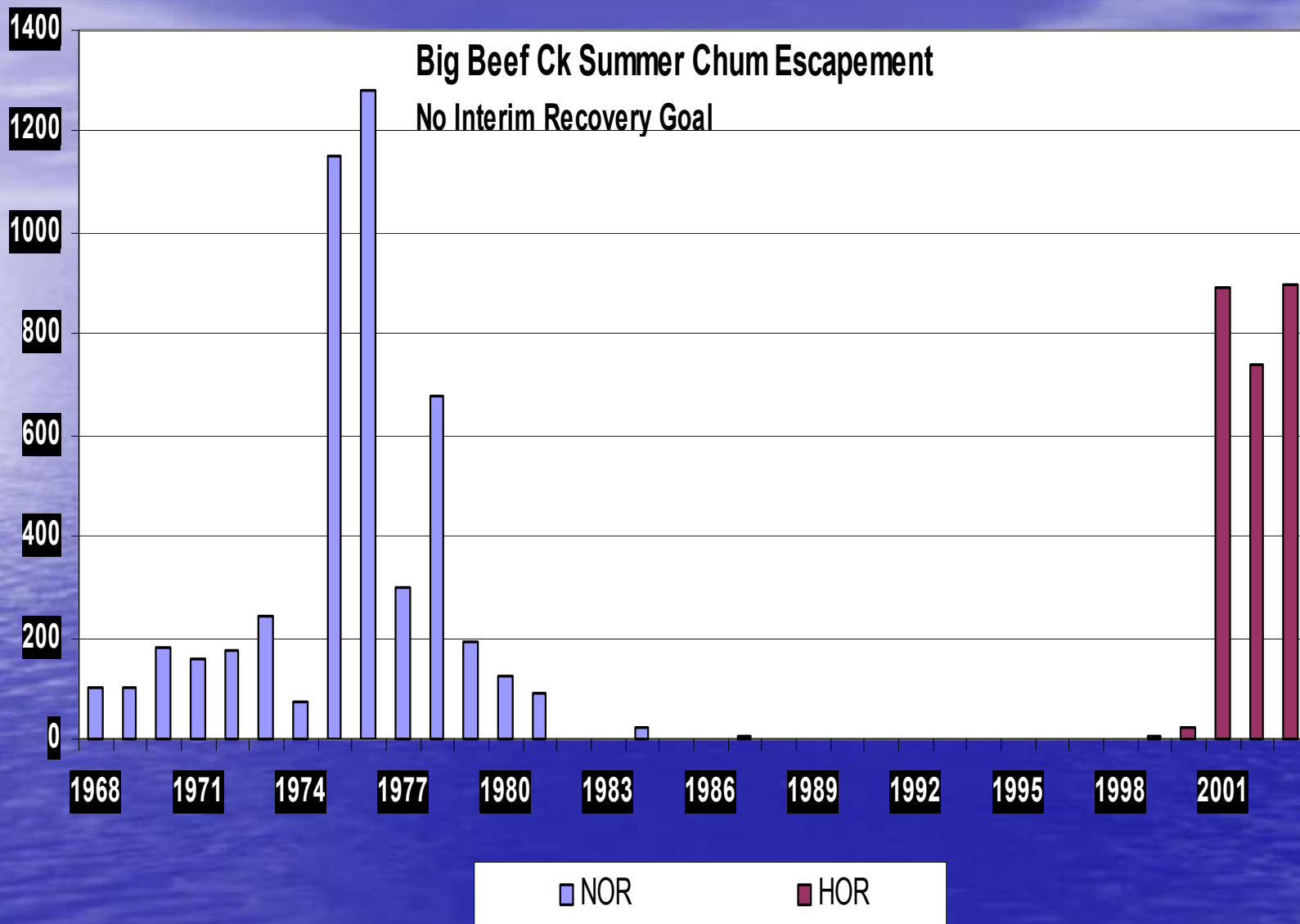


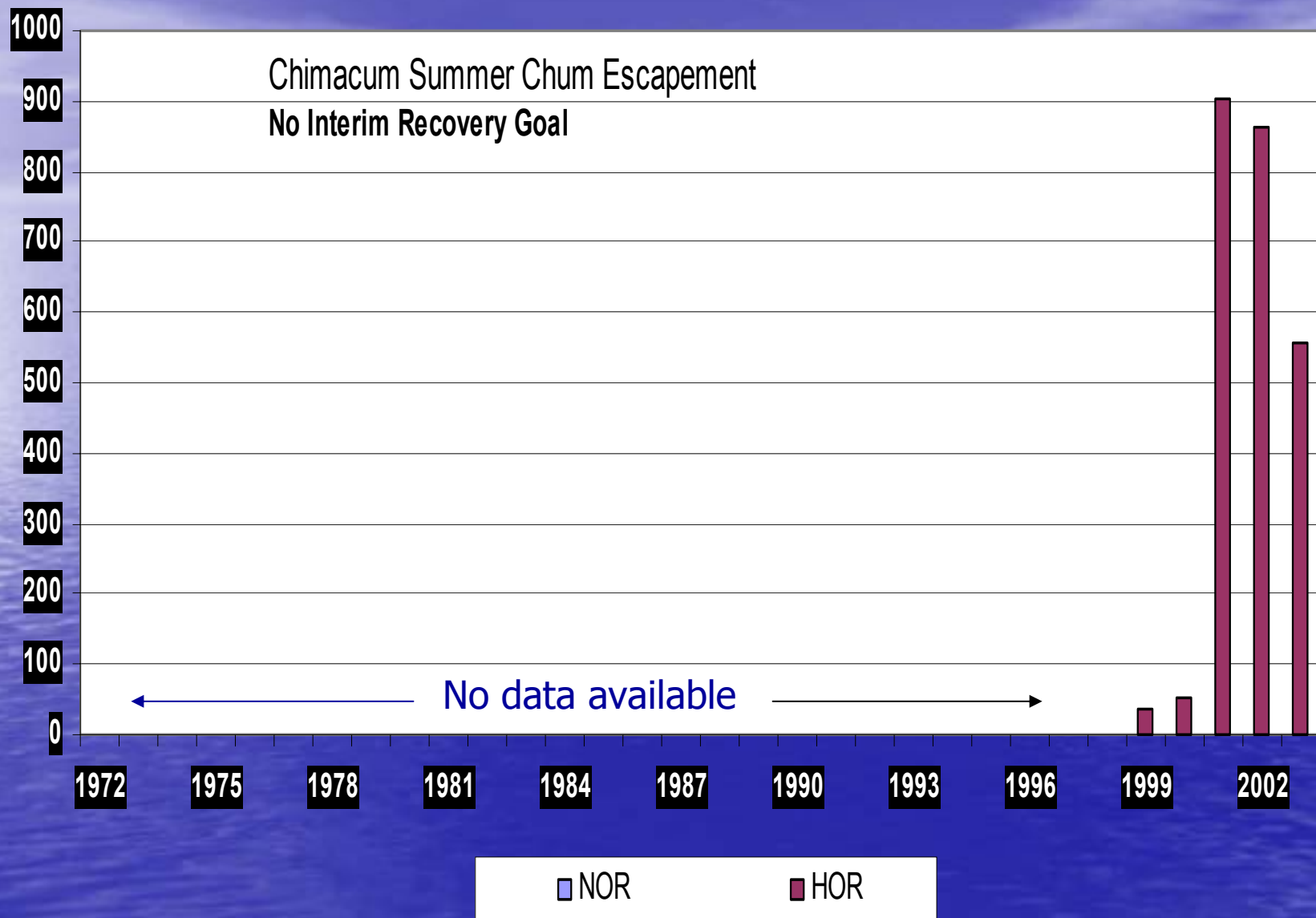


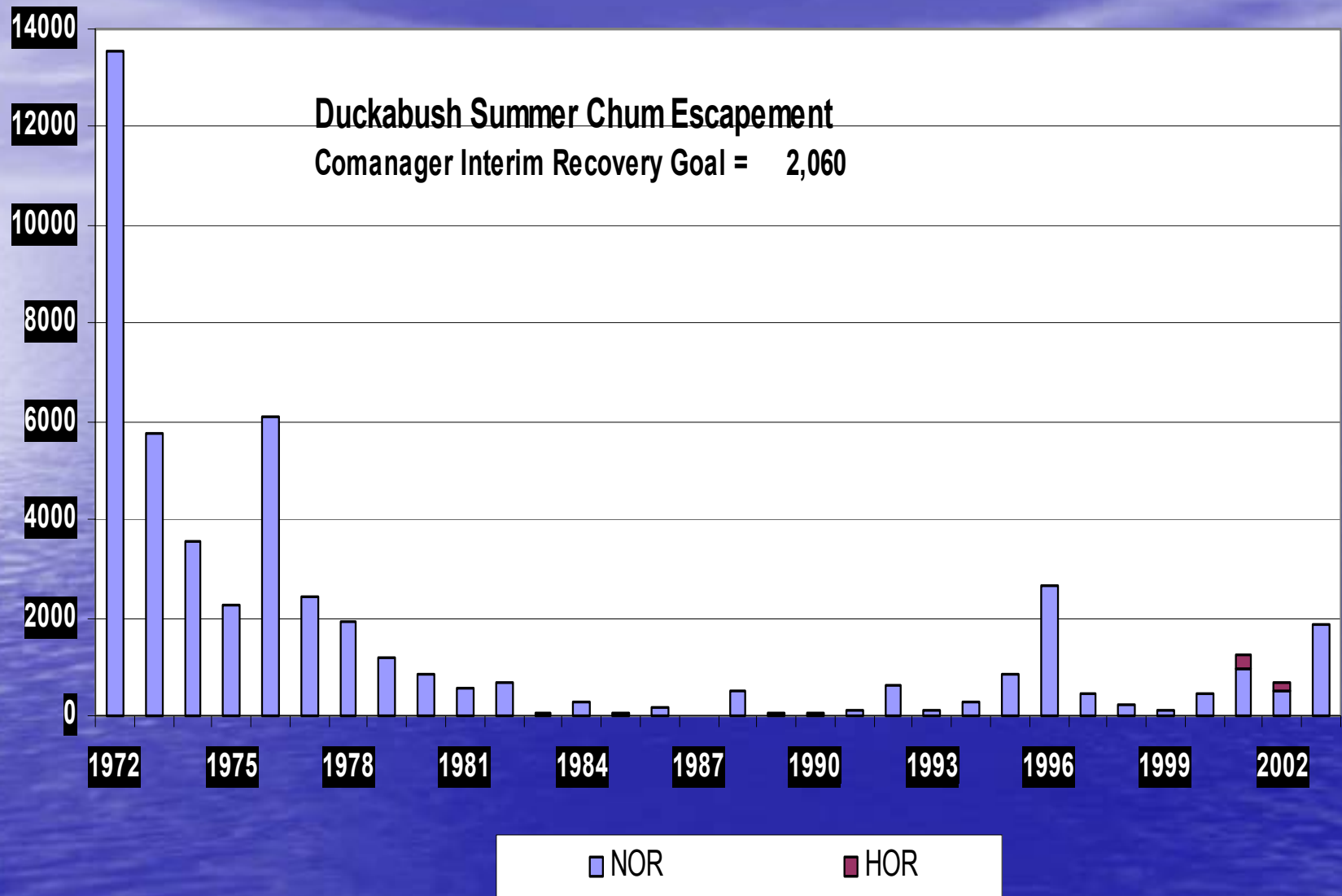




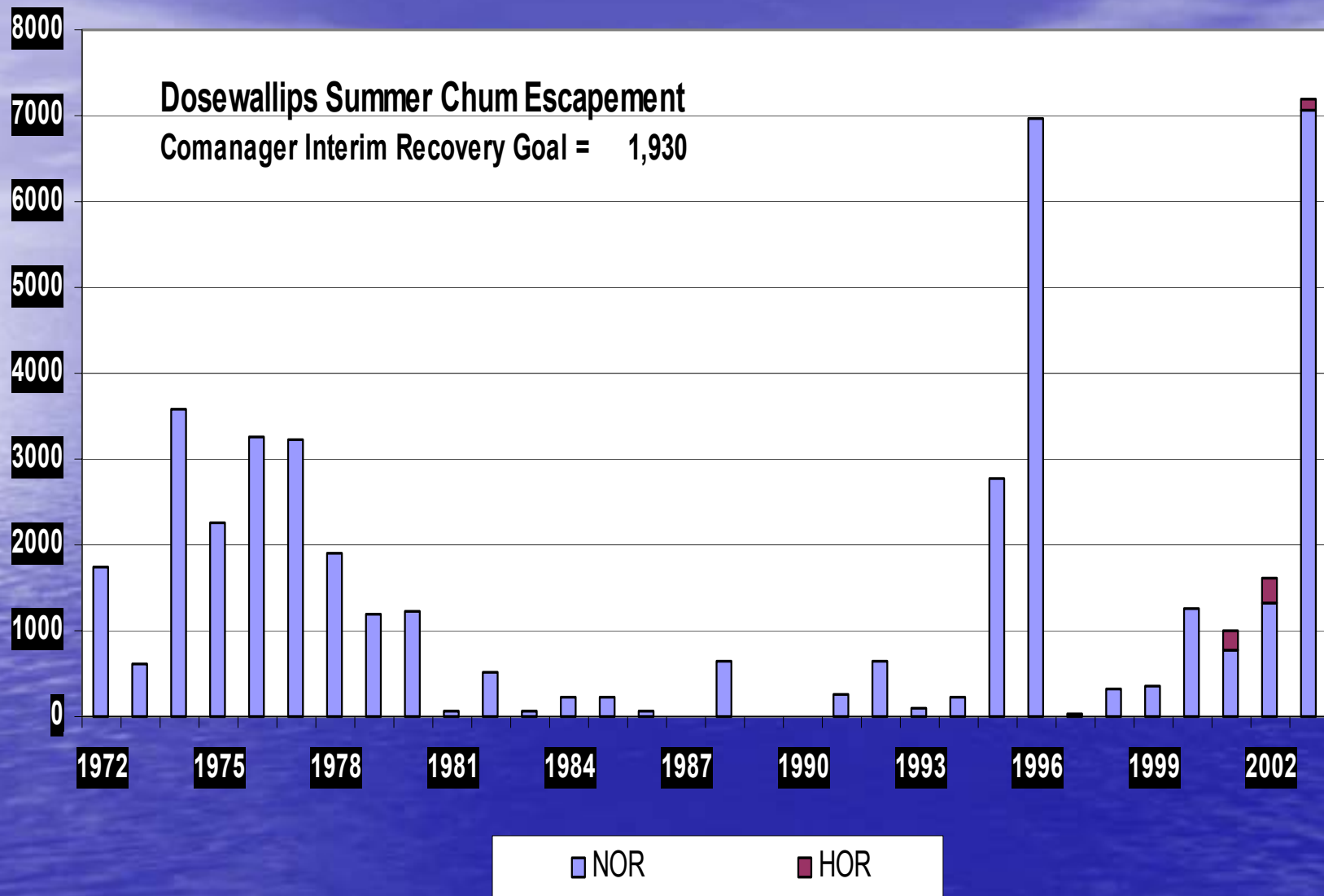












# Dungeness Summer Chum Escapement ????

- No escapement estimates
- 70 historical survey observations in WDFW survey database
- Periodic sightings indicate modest sized, self-sustaining population is present.
- Status is unknown.

*"The effects of hatchery fish on the likelihood of extinction of an ESU, depend on how hatchery fish affect four key attributes"*





# Abundance

- Data indicate that the programs are increasing the abundance of naturally spawning summer chum salmon for most target populations.
- Several programs likely prevented further extirpations.
- Effects on natural origin summer chum abundance uncertain: these are new programs, for which more years needed, especially post supplementation. Sustainability?
- Programs cannot resurrect 7 extirpated populations; seeding three streams with extant stocks.
- All sunset after 12 years.



# Productivity

- Program effects uncertain (more data needed), and pending functioning habitat.
- Estimated R/S data indicate that Quilcene NOR productivity was below replacement for two complete brood years and near “goal” for 2 incomplete broods coincident with supplementation – more years needed; m&e continuing.
- 2 reintroduction programs are leading to natural spawning in tributaries where no spawning had occurred for 20 years; Tahuya too in 2006?
- Nearly all programs meeting fry to adult survival expectations ( $\sim 1.6 - 2.0\%$ ).

# Spatial Structure

- Programs are benefiting spatial structure of several populations (increased spawning area use within watersheds with increased abundance).
- Reintroduction programs are range extensions for 3 extant populations.
- Several programs likely prevented (preventing?) extirpations/loss of extant structure, given recent extirpations and dramatic decline of abundances for extant populations.

# Diversity

- Programs have bolstered total population sizes – likely stemmed small population effects for several stocks (2 to 3 NOR brood years in most populations down to 1, 10, 50 fish).
- Extirpations and loss of total ESU diversity prevented by programs for several populations.
- Reintroductions serve as genetic reserves for donor extant populations.
- Measures are applied to maintain genetic diversity (12 year limit, use native stocks, appropriate hatchery brood collection/mating protocols (SCSCI).
- Straying, and effects? Mass marking and M&E.



# Effect of Artificial Propagation on VSP Attributes

Viability Criteria	BRT VSP Risk Score	Decreases Risk	Neutral or Uncertain	Increases Risk
Abundance	3.7	✓		
Productivity	3.4		✓	
Spatial Structure	3.7	✓		
Diversity	3.5	✓		

# Hatchery Effect on BRT Status Finding for Hood Canal Summer Chum ESU

		Endangered	Threatened	Not warranted
% of BRT Votes		21%	74%	5%
SRD Finding			X	

Summary: Programs appear to have benefited 3 of 4 VSP attributes coincident with their short period of operation. However, given the intent to terminate each program after 12 years, viability and extinction risk to the ESU will depend entirely on performance of natural-origin populations “soon” in their available habitat, which is uncertain.